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A SURVEY OF SPORT FISHING IN THE ILLINOIS PORTION OF LAKE MICHIGAN

March through September, 2009

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Institute of Natural Resource Sustainability
Illinois Natural History Survey

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Table 1. Common and scientific names of fishes appearing in this report of the survey of sport fishing in the Illinois portion of Lake Michigan. Only common names will be used in the following text.

Common Name	Scientific Name
Alewife	*Alosa pseudoharengus*
Black crappie	*Pomoxis nigromaculatus*
Bluegill sunfish	*Lepomis macrochirus*
Brown trout	*Salmo trutta*
Channel catfish	*Ictalurus punctatus*
Chinook salmon	*Oncorhynchus tshawytscha*
Coho salmon	*Oncorhynchus kisutch*
Common carp	*Cyprinus carpio*
Freshwater drum	*Aplodinotus grunniens*
Lake trout	*Salvelinus namaycush*
Largemouth bass	*Micropterus salmoides*
Northern pike	*Esox lucius*
Rainbow smelt	*Osmerus mordax*
Rainbow trout	*Oncorhynchus mykiss*
Rock bass	*Ambloplites rupestris*
Round goby	*Apollonia melanostoma*
Sea lamprey	*Petromyzon marinus*
Smallmouth bass	*Micropterus dolomieui*
Yellow perch	*Perca flavescens*

EXECUTIVE SUMMARY

The purpose of this study was to provide estimates of the non-charter sport fishing effort, harvest and expenditures of anglers fishing the Illinois portion of Lake Michigan. The information provided from this study is important to the management of the sport fisheries in the Illinois waters of Lake Michigan. A contact creel survey was used to collect data concerning the daily effort, harvest and expenditures on randomly selected days over a six month period (4/1 - 9/30). The data were summarized and extrapolated over the six month period to achieve estimates for specific locations as well as for the Illinois waters of the lake. The creel period was stratified by time period (segment = three week blocks) and type of day (weekday vs. weekend/holiday). Also, a March survey was conducted at selected sites along the Lake Michigan shoreline. That survey was stratified in a similar fashion as the main survey except that the segment is one month long instead of three weeks. However, all the data is now being presented in a monthly format instead of by segment. Data from the previous nine years has also been converted to the monthly format. Launched boat and moored boat data are now combined as boats.

Conclusions:
1. 2009 saw a slight decrease in angler effort (down 0.6% compared to 2008). Pedestrian effort increased 14.5% but boat effort (launched and moored combined) decreased 17%.

2. The number of yellow perch harvested decreased 17% compared to 2008. The total harvest was over 263,500 fish. Mean length increased to 28.4 cm (11.2 in) but mean weight decreased to 277 g (0.61 lb), a 0.7% increase and 3.2% decrease respectively compared to 2008.

3. Coho salmon was the largest portion of the salmonid harvest in the Illinois waters of Lake Michigan and increased nearly 11% compared to 2008. The total harvest was 17,700 fish. The average size coho in 2009 weighed 1,789 g (3.94 lb), and measured 55.9 cm (22.0 in) in length, an increase of 29.2% in weight and 6.7% in length.

4. Chinook salmon harvest decreased nearly 37% compared to 2008 with a harvest of 6,900 fish. The average size chinook increased compared to 2008 with length 70.8 cm (27.9 in) and weight 3,913 g (8.62 lb), an increase of 4.1% and 17.9% respectively.

5. The rainbow trout harvest decreased by 25% compared to 2008, with a harvest of 1,700 fish. Rainbow trout length and weight increased compared to 2008 with length increasing 5.8% to 66.2 cm (26.1 in) and an increase in weight of 21.4% to 2,856 g (6.29 lb).

6. The lake trout harvest decreased by nearly 59% compared to 2008 to 700 fish. The average size of lake trout harvested in 2009 was longer but lighter than those fish harvested in 2008 with a decrease of 4.4% in weight to 3,128 g (6.89 lb) and an increase in length of 3.9% to 69.5 cm (27.4 in).

7. The brown trout harvest decreased by 64% compared to 2008 to 1,600 fish. Average length increased by 2.9% to 56.8 cm (22.4 in) and average weight increased by 6.6% to 2,479 g (5.46 lb).

8. Total expenditures in 2009 were $9.4 million, 61.3% above 2008.

9. The 2009 March survey saw declines in brown trout harvest and coho salmon harvest and increases in effort, yellow perch and rainbow trout harvest compared to 2008. Total effort was 16,405 angler hours, an 81% increase compared to 2008. Harvest of brown trout (170) and coho salmon (121) declined 60% for brown trout and 85% for coho salmon. Yellow perch (19,322) increased 1,400% and rainbow trout (85) increased 64%.

ABSTRACT

A survey of sport fishing in the Illinois portion of Lake Michigan was conducted from April 1 to September 30, 2009. The survey covered all legal sport fishing during that period excluding fishing from chartered boats and smelt fishing. It included angling by pedestrians and fishing from boats. The intent of the survey was to provide reliable estimates of sport fishing activity, sport fish harvest, expenditures for sport fishing, and the quality and distribution of sport fishing. Estimated total fishing effort for pedestrians and boaters was 543,000 angler-hours. Estimated total harvest included 263,500 yellow perch, 1,600 brown trout, 1,700 rainbow trout, 700 lake trout, 17,700 coho salmon, and 6,900 chinook salmon. Estimated expenditures for boats, motors, trailers, fishing gear, and automobile gas were over $9.4 million. The yield value of the sport fishing harvest was approximately $1.9 million.

One additional special survey was conducted. From March 1 to March 31 an early season survey was conducted at Waukegan Harbor, Montrose Harbor and Calumet Park for pedestrian anglers and Waukegan Harbor and Calumet Park for launched-boat anglers. Anglers from both groups fished a total of 16,400 hours and harvested 19,300 yellow perch, 170 brown trout, 90 rainbow trout and 120 coho salmon. Estimated expenditures for boats, motors, trailers, fishing gear, and automobile gas were over $626,000.

INTRODUCTION

This report summarizes a survey of sport fishing in the Illinois portion of Lake Michigan from April 1 to September 30, 2009. The survey covered all types of legal sport fishing during that period, with the exceptions of charter-boat fishing and smelt fishing. In addition, a supplemental survey of the early spring fishery from March 1 to March 31 was conducted. The intent of the project was to provide reliable estimates of sport fishing activity, sport fish harvest, expenditures for sport fishing, and quality of sport fishing. Biological data concerning length, weight, sea lamprey wounding and scarring and markings (fin clips and external tags) were also collected for individual fish. Results from the first twenty-three years of this series of annual surveys were reported elsewhere and were summarized by Brofka and Czesny (2009). Prior to these reports, the most recent creel survey of this type in Illinois was conducted in 1979 by Muench (Muench 1981).

Geographic setting

The geographic setting of this survey was the 63 mile Illinois shoreline of Lake Michigan (Figure 1). This area is highly developed and heavily industrialized. Chicago covers roughly one-third of the shoreline, and a series of smaller cities cover almost all of the remainder. This section of Lake Michigan lacks significant tributary streams. The slope of the near-shore lake bottom becomes progressively steeper as one moves from south to north, a geographic feature that influences the distribution and success of sport fishing. This progression means that boaters from Chicago must go considerably farther from shore to reach good salmon waters than boaters departing from North Point Marina.

Figure 1. The Illinois shoreline of Lake Michigan.

METHODS

The following groups were considered separately: (1) Pedestrian and launched-boat anglers. These anglers were studied directly through personal interviews and direct head counts conducted between 1 April and 30 September. (2) Anglers using moored boats. The data presented here are based entirely on extrapolations from estimates for anglers using launched boats.

Pedestrians and launched-boat anglers

Estimates of effort and harvest by pedestrian and launched-boat anglers were made for selected primary fishing areas, and those estimates were extrapolated to less heavily fished areas. For each primary fishing area, a modified stratified random sampling design similar to that suggested by Malvestuto (1996) was used. The fishing day was the primary sampling unit. Daily estimates of variables of interest (total harvest by species, expenditures by category, etc.) for each primary site were combined to form seasonal estimates using the formula for stratified random samples given by Cochran (1977).

Use of primary fishing areas

The primary fishing areas for pedestrian anglers were North Point Marina, Waukegan Harbor, Montrose Harbor, Belmont Harbor, Burnham Harbor, McCormick Place, Jackson Park, and Calumet Park. The primary fishing areas for launched boats were North Point Marina, Waukegan Harbor, Diversey Harbor, Burnham Harbor, and Calumet Park. For each day of work, a creel clerk was assigned to visit three areas, two pedestrian areas and one launch area, in a prescribed order. The three areas were always one of four groups: (1) Waukegan Harbor (pedestrians), North Point Marina (pedestrians), North Point Marina (launched boats); (2) Montrose Harbor (pedestrians), Belmont Harbor (pedestrians), Diversey Harbor (launched boats); (3) Burnham Harbor (pedestrians), McCormick Place (pedestrians), Burnham Harbor ramp, (launched boats); and (4) Jackson Park (pedestrians), Calumet Park (pedestrians), Calumet Park (launched boats). The launch ramps at Waukegan Harbor were added in 2006 and were surveyed in the same manner as the launch ramp sites in the four groups. Estimates obtained for the primary fishing areas were extrapolated to all other areas based on the distribution of pedestrian anglers and boat trailers. These distributions were obtained by helicopter flights that were conducted on four weekends during the spring and summer. During each flight, pedestrian anglers were counted and recorded on a form divided by site and the type of pedestrian site: structure (piers and breakwalls), shore (shoreline) and harbor (inside enclosed harbors). Pedestrian anglers who were not at a recognized site were counted and listed in the vicinity of the closest recognized site; the sum of these became the total for "other areas" on the form. Boat trailers with a vehicle attached were counted in the parking lots of launch ramps and were listed on the form at the appropriate site. All of the data collected were combined for the season and averaged, and converted to percentages (Table 2).

Distribution of fishing

Pedestrians and launched boats

The survey recognized 25 fishing areas (Table 2). Helicopter flights in 1985-90 and 1992-2009 were used to determine the distribution of fishing. In 2009 the 25 areas accounted for 98.3% of the pedestrian anglers observed in the aerial surveys and 100% of the boat trailers parked near launch areas. Boats launched from the Calumet Yacht Club (25 to 50 launches per week in mid summer) were not included in this survey. In this survey, interviews were conducted at eight pedestrian fishing areas and five launch areas. The pedestrian areas (North Point Marina, Waukegan Harbor, Montrose Harbor, Belmont Harbor, Burnham Harbor, McCormick Place, Jackson Park, and Calumet Park) accounted for 90.2% of the pedestrian anglers observed during the helicopter flights. The five launch areas (North Point Marina, Waukegan Harbor, Diversey Harbor, Burnham Harbor, and Calumet Park) accounted for 90.4% of the boat trailers observed near launch areas.

Table 2. Distribution of pedestrian anglers and boat trailers along the Illinois shoreline of Lake Michigan, determined by helicopter flights in 2009.

Area	Pedestrian anglers (%)	Boat trailers (%)
1. IL Beach State Park & North Point Marina	0.8	29.8
2. Waukegan Harbor and breakwalls	3.3	25.3
3. Great Lakes Naval Training Station	0.0	0.5
4. Forest Park	0.0	0.0
5. Central Park	0.0	0.5
6. Winnetka (Lloyd and Tower Parks)	0.0	2.0
7. Wilmette Harbor	0.2	NA
8. Northwestern Univ. and Dawes Park	0.3	4.0
9. Farwell Avenue pier	0.7	NA
10. Hollywood Avenue pier	0.6	NA
11. Foster Avenue pier	0.2	NA
12. Montrose Harbor and breakwalls	59.8	NA
13. Belmont Harbor	7.9	NA
14. Diversey Harbor and breakwalls	2.7	10.1
15. North Avenue pier	0.0	NA
16. Navy Pier	0.1	NA
17. Monroe Street breakwalls	0.1	NA
18. Burnham Harbor and vicinity	11.2	5.1
19. McCormick Place seawall	0.9	NA
20. 31st Street pier	0.5	NA
21. 50th Street access area	0.2	NA
22. 59th Street Harbor	1.0	NA
23. Jackson Park Harbor and breakwall	6.0	2.5
24. Rainbow Park	0.0	NA
25. Calumet Park	0.4	22.2
26. other areas	3.1	0.0

Moored boats

The principal boat mooring areas are North Point Marina, Waukegan Harbor, Great Lakes Naval Training Station, Wilmette Harbor, and the Chicago Park District harbors. This survey did not include boats kept at moorings or on land (lift service) in the Calumet or Chicago river systems. We used the number of power boats kept at moorings as an index of fishing activity from moored non-charter power boats (Table 3). Although some fishing occurs from sail boats, we assumed that it was a negligible portion of all fishing. Both private lift services, referred to as I/O service in Table 3, were included in the survey (Larsen Marine, at Waukegan Harbor and Skipper Bud's at North Point Marina).

Table 3. Mooring locations along the Illinois shoreline of Lake Michigan and numbers of non-charter power boats moored at each location, as determined by the marinas and port authorities. Total number of power boats per port in bold.

Mooring area	Number of power boats
North Point Marina	**1,091**
Public Moorings	1,021
Skipper Bud's I/O service	70
Waukegan Harbor	**759**
Public Moorings	639
Larsen Marine I/O service	120
Great Lakes Naval Training Station	**30**
Wilmette Harbor	**65**
Chicago Park District	**3,655**
Diversey	600
Burnham	810
other harbor moorings	2,245

Early spring survey

Only two site groups were surveyed in March. The Lake County group consisted of Waukegan Harbor (pedestrians) and Waukegan Harbor (launched boats). The Chicago group consisted of Montrose Harbor (pedestrians), Calumet Park (pedestrians), and Calumet Park (launched boats). These sites included virtually all the open boat ramps and the areas of heaviest concentrations of open water pedestrian anglers this early in the season (based on personal observations and previous surveys). No attempt was made to estimate moored boat effort, harvest or expenditures in the March survey because very few boats are at moorings at that time.

Selection of dates in a stratified random sample

The core fishing season (1 April through 30 September 2009) was stratified by segment and type of day. Each date fell within one segment and was either a week day (non holiday Monday through Friday) or a weekend day (weekends and holidays). The following 18 strata were formed:

1. week days 4/1 - 4/19	2. weekend days 4/1 - 4/19
3. week days 4/20 - 5/10	4. weekend days 4/20 - 5/10
5. week days 5/11 – 6/1	6. weekend days 5/11 - 6/1
7. week days 6/3- 6/22	8. weekend days 6/3- 6/22
9. week days 6/22 - 7/12	10. weekend days 6/22 - 7/12
11. week days 7/13 – 8/2	12. weekend days 7/13 – 8/2
13. week days 8/3 - 8/23	14. weekend days 8/3 - 8/23
15. week days 8/24 - 9/13	16. weekend days 8/24 - 9/13
17. week days 9/14 - 9/30	18. weekend days 9/14 - 9/30

Within each stratum, dates were selected at random with the restriction that all four groups of sites were sampled one week day (Monday through Friday) and each weekend. This sampling process was conducted separately for each of the four groups of three areas. Three dates were selected from each stratum except 1, 2, 17 and 18; in those strata, which were several days shorter than the others, fewer than three dates were selected for each group of areas. All three areas in each group were visited on the dates selected for that group.

The early spring survey (1 March through March 31) was treated in a similar fashion to the core survey except that the segment was one month.

1. week days 3/1 - 3/31	2. weekend days 3/1 - 3/31

Data collection
Data collection at pedestrian fishing areas consisted of counting all pedestrian anglers at the start and finish of a two-hour interview period and interviewing a representative sample of anglers during the two hours. At the eight primary pedestrian areas the interview period was always 0600 to 0800 or 0830 to 1030. Each interview was designed for one angling party (i.e., one or more anglers fishing together) rather than for one individual angler. By interviewing parties instead of all individuals in a party more interviews can be conducted in a given time frame, redundant information can be avoided, and annoyance to the party is minimized. At launch ramps, all trailers with vehicles attached (except personal watercraft trailers) were counted in the parking lot at the beginning and end of the sampling period (between 1100 and 1300) and a representative sample of all returning fishing parties was interviewed.

The interviewers (referred to as creel clerks) gathered information related to effort (number of angler-hours, number of angler-trips), expenditures for the present fishing trip (by category: major = boat, motor, or trailer; minor = fishing gear; other = auto gas @ 10 cents per mile), species sought, and harvest (by species). Clerks also weighed and measured fish in possession of the anglers, noted clipped fins, and noted sea lamprey wounds and scars. The data form and instructions to creel clerks are in (Brofka and Czesny, 2009).

Variables measured for each date
The data collected in the interviews on one date at one area were reduced to a set of variables describing daily fishing activity: (1) Harvest per angler-hour was determined for each species as the number of fish harvested by all parties interviewed divided by the number of hours of fishing by individuals in those parties. (2) Expenditures per angler-trip were determined in each of three categories (major, minor, and other). For all expenditures, total expenditures by all anglers interviewed were divided by the number of anglers interviewed. (3) Angler-hours (i.e., total time spent fishing by all anglers) and (4) angler-trips (i.e., total number of anglers who fished) were determined differently for pedestrians and boaters. For pedestrians, angler-hours was the average number of anglers (at start and finish of interviews) multiplied by the number of hours in the day (from 0.75 hour before sunrise to 0.75 hour after sunset), and angler-trips was angler-hours divided by the average duration of a pedestrian fishing trip (3.71 hours for all interviews with conventional pedestrian anglers from 2000 - 2009 surveys). The number of fishing boats launched for the day was estimated by multiplying the number of fishing boats landing during the two-hour interview period by the estimated average ratio of the number of all boats returning in a day to the number returning between 11:00 and 13:00. That ratio was estimated to be 2.38 by monitoring all boat traffic at North Point Marina on 3 days in 2009. Angler-trips were then estimated as the total number of boats launched for the day multiplied by the average number of anglers per boat (2.34, based on data from 2000 - 2009). Angler-hours were taken as angler-trips multiplied by the yearly average number of hours per angling trip by boaters (5.09, based on data from 2000 - 2009). (5) Harvest was determined for each species as harvest per angler-hour multiplied by angler-hours, and (6) expenditures were determined for each category as expenditures per angler-trip multiplied by angler-trips.

Expansion of daily estimates
The formula given by Cochran (1977) for stratified random samples was employed to expand the daily estimates to form seasonal area-specific estimates of effort, harvest, and expenditures.

Seasonal averages of harvest per angler-hour were obtained for each primary fishing area by taking unweighted averages of daily values. In these calculations, seasonal averages for yellow perch included only data from anglers who were fishing for perch, and seasonal averages for salmonids included only data from anglers who were fishing for salmonids. Anglers who did not specify what they were fishing for were excluded from these calculations.

Extrapolation to other areas
Extrapolations of seasonal estimates from primary fishing areas to other areas were based on the distributions of pedestrian anglers and boat trailers (Table 2). The distribution of boat trailers was assumed to reflect the distribution of launched-boat anglers. In the extrapolations, harvest, effort, and expenditures at areas not visited were estimated by extension of estimates for the nearest primary fishing areas. Thus, for pedestrian anglers, estimates for Waukegan Harbor were extended to all other areas (except North Point Marina) north of and including Wilmette Harbor; estimates for Montrose Harbor were extended to all remaining areas north of Belmont Harbor; estimates for Belmont Harbor were extended to all remaining areas north of the Monroe Street breakwalls; estimates for Burnham Harbor

were extended to all remaining areas north of McCormick Place; estimates for McCormick Place were extended to all remaining areas north of 31st Street; estimates from Jackson Park were extended to all remaining areas north of Rainbow Park; and estimates from Calumet Park were extended to all remaining areas south of (and including) Rainbow Park. For launched boats, estimates for Waukegan Harbor were extended to all launch ramps north of Wilmette (including the "other" areas listed in Table 2); estimates for Diversey were extended to Dawes Park; and results for Calumet Park were extended to the ramp at Jackson Park.

Moored boats

Estimates of effort, harvest, and expenditures by anglers using moored boats were extrapolated from calculations for launched boats. First, the ratios of moored fishing boats to launched fishing boats for North Point Marina, and Diversey Harbor were estimated. On five dates during the spring and summer of 2009 counts were made of the numbers of fishing boats returning to moorings while simultaneous counts were made of the number of fishing boats returning to the launch ramp. Charter boats were excluded from the counts. The ratio of moored to launched boats was 0.82 in North Point Marina and 0.5 in Diversey Harbor. Using these figures, seasonal estimates of effort, harvest, and expenditures by anglers using launched boats at North Point and Diversey harbors were extrapolated to moored boats. Thus, for example, the moored boat harvest at North Point Marina for a given segment was estimated to be the launched boat harvest for that segment multiplied by 0.82. Values so derived for North Point and Diversey harbors were then extrapolated to other moored boats based on the distribution of moored power boats. Estimates for North Point Marina were extrapolated to boats moored in Waukegan Harbor, Wilmette Harbor, and Great Lakes Naval Training Station, and the estimates for Diversey Harbor were extrapolated to all other boats moored in Chicago.

Changes in creel survey methods

Creel survey methods have varied during the past twenty-four years of the creel survey, so comparisons should be made with caution, especially where estimates for anglers using moored boats are concerned.

Confidence intervals and bias

Estimates of harvest, effort, and expenditures are presented without confidence intervals. Confidence intervals presented without estimates of bias are meaningful only if bias is assumed to be negligible, an assumption that we are not willing to make. Although we have collected and will continue to collect data with which to partially assess biases, we are presently unable to make such assessments.

Yield values

Here the term yield value means the hypothetical market price of the sport fish harvest. The market prices of fillets were used. The estimated harvest for each species was multiplied by the average individual weight of fish weighed in our survey. That estimated harvested round weight was then multiplied by a factor to estimate the harvested market weight. For fillets, the factor was 0.40 because approximately 60% of the fish is wasted in the filleting process. Total harvested marketable weight was then multiplied by approximate market prices (prices observed on the Internet by W.A. Brofka).

Missing data

On some dates creel clerks were unable to complete their assigned interviews. When data were missing from some but not all of the assigned dates in a stratum, estimates for the stratum were based only on data from the completed dates. In these cases, the sample size was smaller than for strata where all interview sets were completed and the estimates were not as precise as estimates derived from full data sets.

Alternate sites/ altered sites

Sometimes, because of unforeseen circumstances (i.e. construction) a primary site may be closed or less accessible during part or all of a sampling season. The fishing pier at North Point Marina wasn’t put in place until the first week of May.

RESULTS

All estimates derived in this survey are given here without qualification; for simplicity of expression, the word "approximately" is not repeated with each estimated value. Estimates are rounded in the following paragraphs.

Total fishing effort in the Illinois portion of Lake Michigan during the study period was 543,000 angler-hours. Anglers harvested 263,500 yellow perch, 17,700 coho salmon, 6,900 chinook salmon, 1,700 rainbow trout, 1,600 brown trout and 700 lake trout. Expenditures for boats, motors, trailers, fishing gear, and automobile gas used on Lake Michigan fishing trips during the study period were nearly $9.4 million. The yield value of the Illinois sport fishing harvest was nearly $1.9 million.

Detailed results for 2009 are presented in Tables 4 - 10. Tables 4 and 5 list seasonal harvest and effort (angler hours) estimates for anglers. Tables 6 and 7 present effort and harvest for each segment. Table 8 provides yield values. Table 9 lists fin clip abbreviations; fin clips observed by our creel clerks are listed in Table 10, with the number of occurrences of each clip or clip combination listed by species. Table 10 can assist in determining the contributions of different stockings of fish to the sport fishery in the Illinois portion of Lake Michigan.

Tables 11 and 12 report angler trips and expenditures among angler types and among years. Tables 13 and 14 compare angler hours and harvest by fish species between angler types and for each year. Table 15 compare minor fish species harvest for each year.

Pedestrian fishing

From April 1 - September 30, 2009, pedestrian anglers made nearly 90,600 trips to Lake Michigan (Table 11) and spent nearly 326,000 hours fishing (Table 4). Yellow perch was the predominant species in the harvest, with a harvest of nearly 148,000 fish (Table 4). Chinook salmon were the next most important species for pedestrian anglers, with a harvest of over 2,900 (Table 4). Pedestrian anglers spent $900,000 ($9.94 per trip) for fishing gear and $140,000 ($1.82 per trip) for automobile gas (Table 11).

Boat fishing

Anglers who used boats made over 41,000 trips to Lake Michigan (Table 11) and spent over 217,000 hours fishing (Table 4). The most abundant species in their harvest were yellow perch (115,600), coho salmon (15,400), chinook salmon (4,000), rainbow trout (1,200), and brown trout (900) (Table 4). For salmonids, North Point Marina was the most productive of the five primary boat areas, accounting for 37% of the lake trout, brown trout, rainbow trout, chinook salmon, and coho salmon taken by anglers who used boats (Table 4). Waukegan Harbor accounted for 28.4% of the yellow perch harvested by boat anglers (Table 4). Expenditures by anglers using boats were $8,331,000 ($201 per trip), with 91% of that amount going for boats, motors, and trailers (Table 11).

Yield values

The estimated yield values of the three most commonly harvested sport species were $965,000 for yellow perch, $475,000 for chinook salmon, and $334,000 for coho salmon (Table 8). Currently, none of the species listed in Table 8 are commercially available from Lake Michigan except yellow perch from the Wisconsin portion of Green Bay. The values of all species are derived from the retail prices of those species commercially harvested or raised in other waters.

Comparisons with preceding years

Total angler fishing effort in 2009 decreased by 0.6% compared to 2008 (Table 13). Pedestrian effort increased by 14.5%, boat effort decreased by 17.0% compared to 2008 (Table 13). Angler success for salmonids (number of fish per angler hour) increased for boat anglers but decreased for pedestrian anglers compared to 2008 (Figure 2a). Angler success for yellow perch decreased compared to 2008 (Figure 2b).

The yellow perch harvest of 263,500 represented a decrease of 17% compared to the 2008 harvest (Table 13 and Figure 4). The average weight of yellow perch kept by anglers decreased slightly to 277g (0.61 lb.) (Table 8). The average length increased to 284 mm (Figure 5). Perch fishing was excellent for Waukegan boat anglers in April , very poor in June, and good in August. Boat and pedestrian anglers in Chicago did well in both June and August (Tables 6 and 7, Figure 6).

The 2009 harvest of coho salmon increased by 10.9% compared to 2008 (Table 13 and Figure 7). Weight 1,789 g (3.94 lb.) of creeled coho salmon increased 29.2% and length (559 mm) increased 6.9% compared 2008 (Table 8 and Figure 8). 55% of the harvest occurred in May (Tables 6 and 7).

The chinook salmon harvest decreased to 6,907 fish for 2008 (Table 13 and Figure 9). Average length was 708 mm, an increase of 4% compared to 2008 and the average weight increased 18% compared to 2008 at 3,913 g (8.62 lb.), (Table 8 and Figure 10). 74.5% of chinook salmon harvest occurred in August and September (Tables 6 and 7).

The 2009 harvest of lake trout was 689, a decrease of 58.5% compared to 2008, (Table 13). The average weight decreased by 4.4% and the average length increased by 3.9% compared to 2008 (Table 8). 60.6% of the harvest occurred in April (Tables 6 and 7).

The 2009 brown trout harvest (1,599) decreased 64% compared to 2008 (Table 13). The average length (568 mm) increased by 2.9% compared to 2008 and the average weight of 2,479 g (5.46 lb.) increased by 6.6% (Table 8). The peak of the harvest (57.8%) occurred in April (Tables 6 and 7).

The 2009 rainbow trout harvest (1,713) decreased by 25.2% compared to 2008 (Table 13). The average length (662mm) and weight 2,856 g (6.29 lb.) increased 5.8% and 21.4% respectively compared to creeled rainbow trout from 2008 (Table 8).

Estimated expenditures for boats, motors, and trailers increased by 157% compared to 2008 (Table 11). Minor expenditures decreased by 41.3% and other expenditures increased by 2.9%.

The 2009 early spring survey saw increases in angler effort, yellow perch and rainbow trout harvest and decreases in coho salmon and brow trout harvest compared to 2008. Angler effort increased 81% compared to 2008. Harvest of coho salmon decreased 85% and brown trout harvest decreased 60%. Yellow perch harvest increased by 1,400% and rainbow trout harvest increased 64%. The bulk of the yellow perch were caught by boat anglers in the Calumet River, though a substantial number were also caught by boat anglers out of Waukegan. (Table14).

Minor species

In addition to the species for which results are presented in detail in Tables 4 - 14, creel clerks reported several other species of fish in possession of anglers (Table 15). For some species, an estimate has been made of the total number of fish harvested and numbers caught (numbers in parentheses). For other species, because so few fish were observed just the actual number observed is reported. Most of the minor species were harvested in or near the harbors. **Rock bass**, 3,934 (24,258); **bluegill sunfish**, 298 (1,082); **common carp**, 240 (782); **freshwater drum**, 1,482 (1,878) ; **smallmouth bass**, 76 (4,514); **largemouth bass**, 0 (899); **channel catfish**, 3 fish observed; **northern pike,** 2 fish observed; **black crappie,** 2 fish observed; anglers also harvested **alewives** for use as bait and caught **round gobies** (some were retained for food, most were not retained).

DISCUSSION

Changes in the fishery and the creel survey in 2009
Continued improvements were made to the database and analysis software. Because of low levels of boating effort the moored boat sampling at Burnham was discontinued. The analysis and reporting of the data has been reformatted to a monthly versus the segment format of the previous reports. The nine previous years of data has also been reformatted.

Angler effort
Total angler fishing effort in 2009 increased for pedestrian but decreased for boat anglers compared to 2008. Effort decreased 17% for boats, but increased 14.5% for pedestrians.

Yellow perch
Annual yellow perch harvests in Illinois were well over one million fish each year from 1986 through 1993 with the exception of 1989. Beginning in 1994 however, harvest fell to fewer than 600,000 and by 1997 fell to well under 60,000 (Brofka and Dettmers, 1997). 2001 saw increased harvest (169,967) due to the combination of the repeal of the slot limit and moving the month closure to July. The annual harvests from 2002 through 2008 saw a general increasing trend to around 300,000. The 2009 pedestrian fishery increased 2.6% but the boat fishery decreased by 33%. Overall effort directed at yellow perch increased 25.8% but HPE (harvest per angler effort expressed in fish per angler hour) decreased 34.9% to 0.89 yellow perch per angler hour.

Coho salmon
Coho salmon have been the main component of both the boat and pedestrian salmonid fishery. In the boat fishery, coho salmon make up 60 to 70% of the salmonids harvested in a typical year. 2009 was a typical year with coho salmon accounting for 62% of salmonids harvested by the non-charter fishery. The 2009 harvest of over 17,700 coho salmon was an 11% increase compared to 2008. Mean weight of harvested coho salmon during 2009 was 1,789 g which was 19% heavier than the twenty-four year mean.

Other salmonids
Coho salmon harvest has traditionally been concentrated in the spring and early to mid-summer. Other salmonids, especially lake trout and chinook salmon, make up the majority of the harvest from mid-summer through the fall. The lake trout harvest was stable from 1991 through 1997 with the exception of 1996. The lake trout harvest in 1998 was exceptional, the highest that this survey has ever seen. 1999 and 2000 saw harvest return to the low level recorded in 1996. The 2001 harvest was very close to the twenty year mean but in 2002 through 2005 returned to the levels seen in 1999 and 2000. The harvest in 2006 (653) was the lowest ever observed by this survey. The 2007 harvest saw an increase. 2008 saw another increase in harvest, 55% (1,541) compared to 2007. In 2009 the harvest declined again to 689 fish. Unlike most years, 60% of the harvest was concentrated in April.

The chinook fishery before 1988 was the mainstay of the summer/fall salmonid fishery. Chinook salmon are highly prized because they can attain a very large size and are extremely powerful fighters. Bacterial kidney disease (BKD) was blamed for die offs of chinook salmon beginning in 1988. Since 1987, the mean harvest of chinook salmon has been around 10,000 fish. The harvest bottomed out in 1994 with 2,900 chinook taken. Chinook salmon are now closely monitored in the hatchery and in the wild for BKD (Clark, 1996). Harvest in 2009 decreased by 36.9% (6,907). Mean weight increased by 18% to 3,913 g (8.62 lbs) compared to 2008.

Brown trout are an important component of the spring salmonid fishery with an average harvest of 4,100 fish annually. Pedestrian angling normally accounts for 70% of those fish. The 2009 harvest of 1,600 browns was a decrease of 64% from the 2008 harvest. The mean weight increased to 2,479 g (5.46 lbs).

Rainbow trout are a component of the spring and summer fishery. Some mature fish are caught in the spring by pedestrian anglers, but the majority of the fish are caught by the boat fishery. The annual mean harvest has been 5,000. 1998 saw the highest harvest of rainbow trout at 11,500. 2009 saw a decrease of 25% compared to 2008 with a harvest of over 1,700 fish. The mean weight increased to 2,856 g (6.29 lbs) in 2009.

Minor species

Certain species that have been present in the areas surveyed since the survey began have grown in prominence. Black bass (smallmouth and largemouth bass) inhabiting the harbors and shoreline of the Illinois portion of Lake Michigan have increasingly been the focus of bass anglers nationwide, as indicated by the national B.A.S.S. tournament based at Burnham Harbor July 19 - 23, 2000. Common carp and freshwater drum are being targeted both by anglers fishing for food and catch and release anglers using European carp tournament fishing techniques. Panfish other than yellow perch are being targeted or kept incidentally by pedestrian anglers, with rock bass being the most numerous; their numbers equal from 2% to 24% of the annual yellow perch harvest in the past ten years. 5.3% of total angling effort was directed at minor species in 2009.

Expenditures

2009 saw an increase in major and other expenditures and a decrease in minor expenditures compared to 2008. Major expenditures (boat, motor and trailers) increased 157%. Minor expenditures (tackle, bait, downriggers, etc.) decreased 41% and other expenditures (mileage) increased 3%.

Early spring (March) survey

The March survey is heavily influenced by the weather in March and the severity of the winter preceding March. 1999 saw a generally mild winter which kept ice formation to a minimum and a powerful storm early (second week). 2000 saw a very mild winter and a relatively calm March. 2003 the shore line and harbors were locked in ice for the first three weeks. 2004 was a marked improvement over 2003 with increases in all categories except lake trout and chinook salmon (which remained the same at zero harvested). 2005 saw a decline in all categories. 2006 was similar to 2005. 2007 saw the harbors still frozen at the beginning of March. 2008 survey was similar to 2007 except that the harbors remained frozen longer. Ice again was a problem in 2009, especially at the Lake County group but the ice had cleared earlier from the Calumet ramp allowing boat access to the Calumet River where excellent yellow perch fishing occurred. Of the last ten years of March surveys, 2009 would rank fifth in effort, first in yellow perch, tenth in brown trout, fourth in rainbow trout and ninth in coho salmon.

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Table 4. Effort (anglers-hours) and harvest (by species) by non-charter anglers in the Illinois portion of Lake Michigan during April-September, 2009. Wau. = Waukegan, N. Point = North Point, Peds = Pedestrian, Lau'd = Launched boat

			Effort		Harvest					
Type of angler	Area	total hours	target perch	target salmon	Yellow perch	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon
Peds	North Point	3,899	2,039	12	682	0	0	0	0	0
	Wau. Harbor	27,386	8,691	17,295	3,340	145	69	0	91	403
	Montrose	168,854	110,209	42,637	78,704	183	213	0	1,207	388
	Belmont	27,332	16,071	9,904	13,631	168	33	0	249	765
	Burnham	28,371	19,525	5,527	19,889	14	108	0	66	92
	McCormick	3,088	1,859	984	1,223	0	6	0	25	16
	Jackson	15,802	7,281	7,182	8,190	61	0	0	317	466
	Calumet	2,512	1,241	379	16	0	0	0	0	0
	other	48,558	26,952	17,790	22,266	174	78	0	411	792
	TOTALS	325,802	193,868	101,710	147,941	745	507	0	2,366	2,922
Boat	North Point	56,857	9,699	46,488	19,845	113	625	220	5,540	1,601
	Wau. Harbor	65,711	28,035	33,906	32,884	117	310	36	5,130	1,202
	Diversey	15,501	7,454	7,300	7,846	211	70	216	1,020	323
	Burnham	11,607	6,997	2,880	15,493	44	0	0	0	0
	Calumet	15,413	9,258	2,304	7,846	87	0	0	424	28
	others	52,104	24,181	23,636	31,687	282	201	217	3,247	831
	TOTALS	217,193	85,624	116,514	115,601	854	1,206	689	15,361	3,985
Summer Totals		542,995	279,492	218,224	263,542	1,599	1,713	689	17,727	6,907

Table 5. Effort (anglers-hours) and harvest (by species) by non-charter anglers at selected sites along the Illinois portion of Lake Michigan during March, 2009. Wau. = Waukegan, Cal. = Calumet, Peds = Pedestrian

		Effort		Harvest					
Location	total hours	target perch	target salmon	Yellow perch	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon
Wau. Harbor	520	0	481	0	10	20	0	0	0
Wau. Ramp	3,986	2,642	1,345	2,122	0	0	0	0	0
Montrose	5,107	474	4,619	108	142	66	0	76	0
Cal. Park Peds	669	61	564	0	8	0	0	8	0
Cal. Park Ramp	6,123	5,863	260	17,093	10	0	0	37	0
Total	16,405	9,040	7,269	19,322	170	85	0	120	0

Table 6. Effort and harvest for each month by pedestrian anglers of the Illinois portion of Lake Michigan during April-September, 2009. Wau. = Waukegan

			Effort		Harvest					
Time Period	Area	total hours	target perch	target salmon	Yellow perch	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon
April	North Point	0	0	0	0	0	0	0	0	0
	Wau. Harbor	2,292	263	1,939	0	82	0	0	54	0
	Montrose	12,585	369	12,154	80	147	63	0	930	0
	Belmont	2,082	41	1,937	51	134	33	0	53	0
	Burnham	462	0	437	0	0	45	0	0	0
	McCormick	0	0	0	0	0	0	0	0	0
	Jackson	1,935	0	1,734	0	61	0	0	103	0
	Calumet	243	36	142	0	0	0	0	0	0
	others	3,632	144	3,299	32	133	32	0	154	0
May	North Point	230	0	12	0	0	0	0	0	0
	Wau. Harbor	3,247	221	2,910	0	47	0	0	0	0
	Montrose	23,717	14,881	7,601	8,028	0	56	0	163	0
	Belmont	2,822	2,311	133	1,604	0	0	0	0	0
	Burnham	2,480	859	309	113	0	0	0	0	0
	McCormick	558	342	34	30	0	0	0	0	0
	Jackson	1,493	771	700	738	0	0	0	0	0
	Calumet	292	85	23	0	0	0	0	0	0
	others	5,441	3,118	1,556	1,762	13	4	0	11	0
June	North Point	255	13	0	0	0	0	0	0	0
	Wau. Harbor	2,516	2,203	191	144	0	0	0	0	0
	Montrose	59,194	57,755	0	31,317	0	0	0	0	0
	Belmont	10,561	10,391	0	9,276	10	0	0	0	0
	Burnham	9,685	9,129	0	11,841	14	0	0	0	0
	McCormick	783	741	0	748	0	0	0	0	0
	Jackson	5,279	5,226	0	5,798	0	0	0	0	0
	Calumet	633	399	0	0	0	0	0	0	0
	others	15,249	14,748	90	18,800	8	0	0	0	0
July	North Point	917	0	0	0	0	0	0	0	0
	Wau. Harbor	2,043	1,034	461	0	0	0	0	0	0
	Montrose	15,857	4,783	77	2,803	0	0	0	0	0
	Belmont	1,179	323	172	150	0	0	0	0	0
	Burnham	2,346	1,224	130	477	0	0	0	0	0
	McCormick	193	185	0	0	0	0	0	0	0
	Jackson	779	162	0	0	0	0	0	0	0
	Calumet	500	279	0	0	0	0	0	0	0
	others	3,262	1,216	290	376	0	0	0	0	0
August	North Point	2,054	1,851	0	682	0	0	0	0	0
	Wau. Harbor	6,749	4,675	1,750	3,177	17	69	0	0	76
	Montrose	38,353	31,380	5,448	36,477	0	0	0	81	0
	Belmont	3,653	2,904	749	2,550	0	0	0	0	185
	Burnham	8,832	8,275	333	7,458	0	0	0	0	0
	McCormick	716	591	125	445	0	0	0	0	0
	Jackson	1,579	1,116	110	1,653	0	0	0	39	0
	Calumet	558	399	4	16	0	0	0	0	0
	others	9,434	7,513	1,521	7,322	5	19	0	24	118

Table 6 continued.

Time Period	Area	Effort: total hours	Effort: target perch	Effort: target salmon	Harvest: Yellow perch	Harvest: Brown trout	Harvest: Rainbow trout	Harvest: Lake trout	Harvest: Coho salmon	Harvest: Chinook salmon
September	North Point	443	175	0	0	0	0	0	0	0
	Wau. Harbor	10,540	295	10,044	19	0	0	0	37	327
	Montrose	19,147	1,041	17,357	0	36	94	0	33	388
	Belmont	7,035	101	6,737	0	23	0	0	196	579
	Burnham	4,564	38	4,318	0	0	63	0	66	92
	McCormick	838	0	825	0	0	6	0	25	16
	Jackson	4,737	6	4,638	0	0	0	0	174	466
	Calumet	286	43	210	0	0	0	0	0	0
	others	11,540	213	11,034	5	15	22	0	222	673

Table 7. Effort and harvest by anglers using boats of the Illinois portion of Lake Michigan during April-September, 2009.

Time Period	Area	Effort: total hours	Effort: target perch	Effort: target salmon	Harvest: Yellow perch	Harvest: Brown trout	Harvest: Rainbow trout	Harvest: Lake trout	Harvest: Coho salmon	Harvest: Chinook salmon
April	North Point	4,297	3,682	615	11,790	56	0	0	169	0
	Waukegan	8,055	7,642	413	9,175	0	0	0	0	0
	Diversey	1,288	0	1,116	0	115	0	216	101	15
	Burnham	368	0	368	0	0	0	0	0	0
	Calumet	3,169	1,385	902	867	80	0	0	393	11
	others	5,287	3,310	1,677	4,121	115	0	201	136	14
May	North Point	15,948	5,484	10,443	7,708	23	100	38	3,580	142
	Waukegan	23,664	14,822	8,776	15,244	8	171	20	4,021	77
	Diversey	2,100	438	1,662	38	96	46	0	124	0
	Burnham	2,269	570	1,060	204	0	0	0	0	0
	Calumet	1,895	331	482	0	7	0	0	20	0
	others	13,835	7,437	5,910	6,843	94	118	9	1,882	33
June	North Point	8,008	120	7,888	0	0	0	114	1,156	89
	Waukegan	8,074	1,232	6,814	69	0	36	16	886	24
	Diversey	3,833	3,452	294	5,278	0	0	0	27	0
	Burnham	2,760	2,443	0	5,353	0	0	0	0	0
	Calumet	3,802	2,779	0	2,613	0	0	0	6	0
	others	9,088	5,333	3,426	8,260	0	16	7	420	11
July	North Point	13,199	109	13,046	9	9	305	42	529	401
	Waukegan	7,562	0	7,154	0	62	27	0	131	320
	Diversey	2,438	0	2,074	0	0	0	0	749	249
	Burnham	414	414	0	0	0	0	0	0	0
	Calumet	3,258	2,980	0	2,881	0	0	0	0	0
	others	6,154	587	5,109	314	27	11	0	754	373
August	North Point	9,655	304	8,927	339	17	111	26	60	821
	Waukegan	8,223	3,156	5,067	6,656	47	40	0	69	411
	Diversey	2,530	2,295	111	2,531	0	0	0	20	20
	Burnham	4,278	3,570	290	9,936	44	0	0	0	0
	Calumet	1,748	1,498	234	1,485	0	0	0	5	0
	others	8,580	5,876	2,337	11,076	46	17	0	49	199

Table 7 continued.

.

Time Period	Area	Effort total hours	target perch	target salmon	Harvest Yellow perch	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon
September	North Point	5,748	0	5,569	0	9	109	0	44	147
	Waukegan	6,865	1,183	5,682	0	0	35	0	24	369
	Diversey	3,312	1,269	2,043	0	0	24	0	0	39
	Burnham	1,518	0	1,162	0	0	0	0	0	0
	Calumet	1,541	285	686	0	0	0	0	0	17
	others	7,121	1,638	5,177	0	0	37	0	11	201

Table 8. Yield values of fish harvested by non-charter sport anglers in the Illinois waters of Lake Michigan during April - September 2009. All fish are assumed to be prepared as fillets with 60% waste. Prices for all except brown trout (used lake trout value) are those current in national markets in January, 2010.

Species	Total harvest	Av. wt (lbs)	Round wt (lbs)	Market wt (lbs)	Price per pound	Yield value
Yellow perch	263,542	0.61	160,761	64,304	$15.00	$964,564
Brown trout	1,599	5.46	8,731	3,492	$9.09	$31,744
Rainbow trout	1,713	6.29	10,775	4,310	$9.80	$42,237
Lake trout	689	6.89	4,747	1,899	$9.09	$17,261
Coho salmon	17,727	3.94	69,844	27,938	$11.95	$333,856
Chinook salmon	6,907	8.62	59,538	23,815	$19.95	$475,116

Combined yield value of all species: $1,864,778

Table 9. Fin clip abbreviations.

Name of fin or bone	Abbreviation
Adipose fin	ad
Dorsal fin	do
Left maxillary bone	lm
Right maxillary bone	rm
Left pectoral fin	lp
Right pectoral fin	rp
Left ventral fin	lv
Right ventral fin	rv

Table 10. Fin clip summary for salmonids harvested by non-charter anglers in the Illinois waters of Lake Michigan during 2009. Typically, only a portion of the salmonids stocked each year are marked. However, all lake trout stocked are clipped. Lake trout examined by clerks which exhibit no fin clips are one of four possibilities: 1. the lake trout is naturally produced (wild). 2. the lake trout failed to receive a fin clip in the hatchery. 3. the lake trout regenerated the missing fin or fins. 4. the clerk did not examine the lake trout thoroughly enough and missed the clip or clips.

	Species				
Clip	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon
ad	3	1	11	2	0
ad,lm	2	0	0	0	0
ad,lp	1	1	1	0	0
ad,lv,rv	0	0	0	0	1
ad,lv	6	0	1	0	0
ad,rp	0	5	1	0	0
do	0	1	0	0	0
lp	1	2	2	4	1
lp,rv	0	0	3	0	0
lv	1	0	2	0	0
rp	3	4	5	0	0
rv	0	3	1	0	0
no	40	70	6	317	204

Table 11. Estimated number of angler trips and expenditures by non-charter anglers in the Illinois portion of Lake Michigan, during 2000 - 2009. NA = not applicable.

		Effort	Expenditures		
Type of angler	Year	(angler-trips)	Major (boat)	Minor (gear)	Other (travel)
Pedestrians	2000	61,168	NA	$357,000	$93,000
	2001	70,356	NA	$526,000	$111,000
	2002	63,690	NA	$624,000	$107,000
	2003	69,578	NA	$747,000	$117,000
	2004	79,062	NA	$882,000	$136,000
	2005	85,449	NA	$574,000	$153,000
	2006	74,719	NA	$973,000	$124,000
	2007	75,041	NA	$477,000	$129,000
	2008	83,841	NA	$1,128,000	$144,000
	2009	90,555	NA	$900,000	$165,000
Boats	2000	42,304	$4,902,000	$706,000	$161,000
	2001	49,184	$7,424,000	$817,000	$166,000
	2002	45,745	$5,270,000	$734,000	$173,000
	2003	50,306	$6,550,000	$828,000	$197,000
	2004	42,205	$11,663,000	$1,140,000	$156,000
	2005	37,582	$7,386,000	$636,000	$139,000
	2006	52,277	$12,293,000	$2,116,000	$174,000
	2007	42,034	$6,914,000	$600,000	$104,000
	2008	47,636	$2,949,000	$1,469,000	$136,000
	2009	41,349	$7,584,000	$624,000	$123,000

Table 11. continued

Type of angler	Year	Effort (angler-trips)	Expenditures Major (boat)	Minor (gear)	Other (travel)
Season Totals	2000	103,472	$4,902,000	$1,064,000	$254,000
	2001	119,540	$7,424,000	$1,343,000	$277,000
	2002	109,435	$5,270,000	$1,358,000	$280,000
	2003	119,884	$6,550,000	$1,576,000	$313,000
	2004	121,267	$11,633,000	$2,022,000	$292,000
	2005	123,031	$7,386,000	$1,210,000	$292,000
	2006	126,996	$12,293,000	$3,089,000	$298,000
	2007	117,075	$6,914,000	$1,077,000	$233,000
	2008	131,477	$2,949,000	$2,597,000	$280,000
	2009	131,904	$7,584,000	$1,524,000	$288,000

Table 12. March fishing effort and expenditures by non-charter anglers at selected sites in the Illinois portion of Lake Michigan, during 1998 – 2000 and 2003 - 2009. NA = not applicable

Type of angler	Year	Effort (angler-trips)	Expenditures Major (boat)	Minor (gear)	Other (travel)
Pedestrians	1998	4,590	NA	$61,000	$13,000
	1999	5,100	NA	$72,000	$12,000
	2000	7,538	NA	$90,000	$20,000
	2003	1,987	NA	$24,000	$4,000
	2004	4,231	NA	$94,000	$8,000
	2005	2,652	NA	$49,000	$6,000
	2006	3,378	NA	$38,000	$7,000
	2007	2,812	NA	$26,000	$5,000
	2008	1,656	NA	$33,000	$3,000
	2009	1,750	NA	$42,500	$4,000
Launched Boats	1998	584	$38,000	$12,000	$2,000
	1999	665	$118,000	$69,000	$2,000
	2000	745	$313,000	$48,000	$2,000
	2003	356	$0	$1,000	$700
	2004	787	$0	$36,000	$2,000
	2005	566	$0	$19,000	$1,300
	2006	594	$0	$33,000	$1,200
	2007	835	$0	$36,000	$800
	2008	605	$0	$37,000	$900
	2009	1,925	$514,000	$61,000	$5,000
March Totals	1998	5,174	$38,000	$73,000	$15,000
	1999	5,765	$118,000	$141,000	$14,000
	2000	8,283	$313,000	$138,000	$22,000
	2003	2,343	$0	$25,000	$5,000
	2004	5,017	$0	$130,000	$10,000
	2005	3,218	$0	$68,000	$7,600
	2006	3,972	$0	$71,000	$8,200
	2007	3,647	$0	$62,000	$5,800
	2008	2,261	$0	$70,000	$3,700
	2009	3,675	$514,000	$103,000	$9,000

Table 13. Fishing effort and harvest by non-charter anglers in the Illinois portion of Lake Michigan, in 2000 - 2009. Peds = Pedestrian anglers, Boat = Boat anglers.

Angler type	Year	Effort (angler-hours)	Harvest					
			Yellow perch	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon
Peds	2000	225,089	35,925	2,794	446	22	7,250	2,284
	2001	255,540	145,656	664	389	66	4,546	2,240
	2002	232,392	142,218	4,016	171	0	10,565	713
	2003	251,773	139,234	1,181	309	0	4,713	1,122
	2004	287,683	169,212	1,474	436	16	4,301	2,790
	2005	307,076	275,632	1,294	250	0	2,211	2,459
	2006	276,536	188,535	692	304	0	348	2,734
	2007	251,912	216,437	1,110	311	34	491	2,543
	2008	284,555	144,144	1,854	395	0	2,179	2,313
	2009	325,802	147,941	745	507	0	2,366	2,922
Boat	2000	209,065	2,430	1,485	1,995	2,435	31,617	8,186
	2001	248,454	24,311	812	6,107	4,603	42,225	5,389
	2002	228,909	22,734	804	3,920	3,034	43,749	7,836
	2003	246,897	31,822	223	2,931	1,969	24,836	10,047
	2004	210,989	42,536	663	2,420	1,628	23,906	10,792
	2005	188,564	27,412	1,095	3,000	1,286	19,035	11,856
	2006	260,217	128,173	2,203	2,651	663	18,286	11,984
	2007	221,692	71,166	638	2,145	849	29,808	8,617
	2008	261,825	173,285	2,594	1,895	1,662	13,799	8,637
	2009	217,193	115,601	854	1,206	689	15,361	3,985
Season	2000	434,154	38,355	4,279	2,441	2,457	38,867	10,470
	2001	503,994	169,967	1,476	6,496	4,669	46,771	7,629
	2002	461,301	164,952	4,820	4,091	3,034	54,314	8,549
	2003	498,670	171,056	1,404	3,240	1,969	29,549	11,169
	2004	498,672	211,748	2,137	2,856	1,644	28,207	13,582
	2005	495,640	303,044	2,389	3,250	1,286	21,246	14,315
	2006	536,753	316,708	2,895	2,955	663	18,634	14,718
	2007	473,604	287,603	1,748	2,456	883	30,299	11,159
	2008	546,380	317,429	4,447	2,289	1,660	15,979	10,950
	2009	542,995	263,542	1,599	1,713	689	17,727	6,907

Table 14. March fishing effort and harvest by non-charter anglers at selected sites in the Illinois portion of Lake Michigan, in 1998 – 2000 and 2003 - 2009. Peds = Pedestrian, Lau'd = Launched boat anglers

Angler type	Year	Effort (angler-hours)	Harvest					
			Yellow perch	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon
Peds	1998	19,735	0	960	35	0	1,059	0
	1999	23,202	0	1,709	189	0	913	0
	2000	34,366	364	3,712	375	0	8,036	0
	2003	9,136	0	175	22	0	15	0
	2004	18,848	170	1,396	360	0	469	0
	2005	11,244	492	762	85	0	173	0
	2006	11,560	0	1,467	65	0	259	0
	2007	9,819	373	764	0	0	386	0
	2008	5,940	261	347	52	0	797	0
	2009	6,296	108	160	85	0	84	0
Lau'd	1998	2,922	0	187	0	0	32	0
	1999	3,131	0	82	16	0	80	0
	2000	3,699	412	376	42	0	2,242	7
	2003	1,780	4,145	10	0	0	0	0
	2004	3,935	9,464	198	9	0	88	0
	2005	2,830	5,308	346	0	0	111	0
	2006	3,199	4,456	478	0	0	182	0
	2007	4,199	10,165	382	9	0	98	0
	2008	3,117	1,024	81	0	0	0	0
	2009	10,109	19,214	10	0	0	37	0
March Totals	1998	22,657	0	1,147	35	0	1,091	0
	1999	26,333	0	1,791	205	0	993	0
	2000	38,065	776	4,088	417	0	10,278	7
	2003	10,916	4,145	185	22	0	15	0
	2004	22,783	9,634	1,594	369	0	557	0
	2005	14,074	5,800	1,108	85	0	284	0
	2006	14,759	4,456	1,945	65	0	441	0
	2007	14,018	10,538	1,146	9	0	484	0
	2008	9,057	1,285	428	52	0	797	0
	2009	16,405	19,322	170	85	0	121	0

Table 15. Minor species harvest by non-charter anglers in the Illinois portion of Lake Michigan, in 2000 - 2009.

Year	Smallmouth bass	Largemouth bass	Rock bass	Bluegill sunfish	Pumpkinseed sunfish	Common carp	Freshwater drum
2000	129	33	9,042	1,863	868	487	3,185
2001	40	0	23,269	1,513	842	3,326	2,362
2002	0	0	10,507	1,230	220	480	1,066
2003	283	0	7,067	514	1,046	193	3,195
2004	0	0	11,003	3,634	1,143	85	1,160
2005	124	18	9,512	848	601	268	3,921
2006	46	97	6,697	550	28	147	2,990
2007	252	49	10,650	269	20	154	1,965
2008	80	45	7,561	405	0	43	2,033
2009	76	0	3,934	298	0	240	1,482

Figure 2 (a). Salmonid harvest per unit effort, derived from the Illinois sport fishing surveys of Lake Michigan, 2000-2009

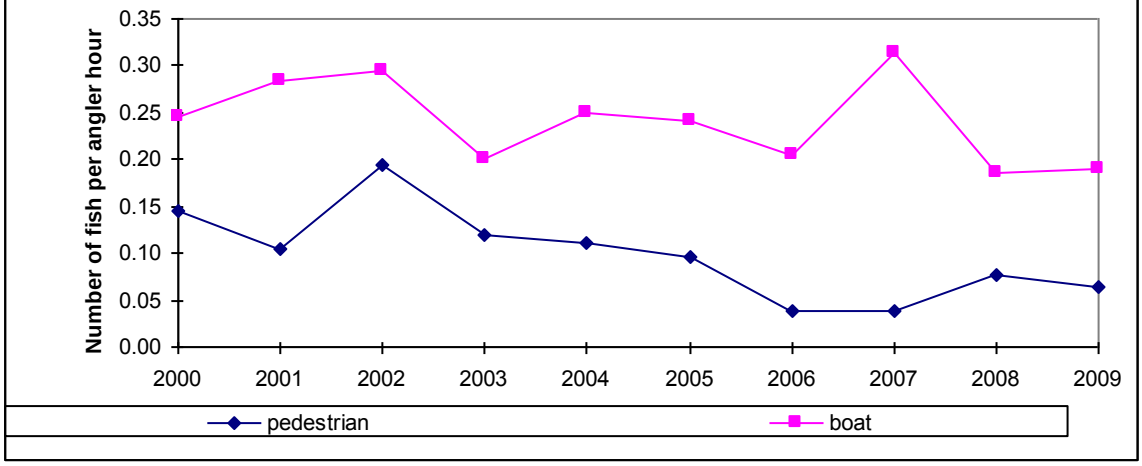


Figure 2 (b). Yellow perch harvest per unit effort, derived from Illinois sport fishing surveys of Lake Michigan, 2000-2009

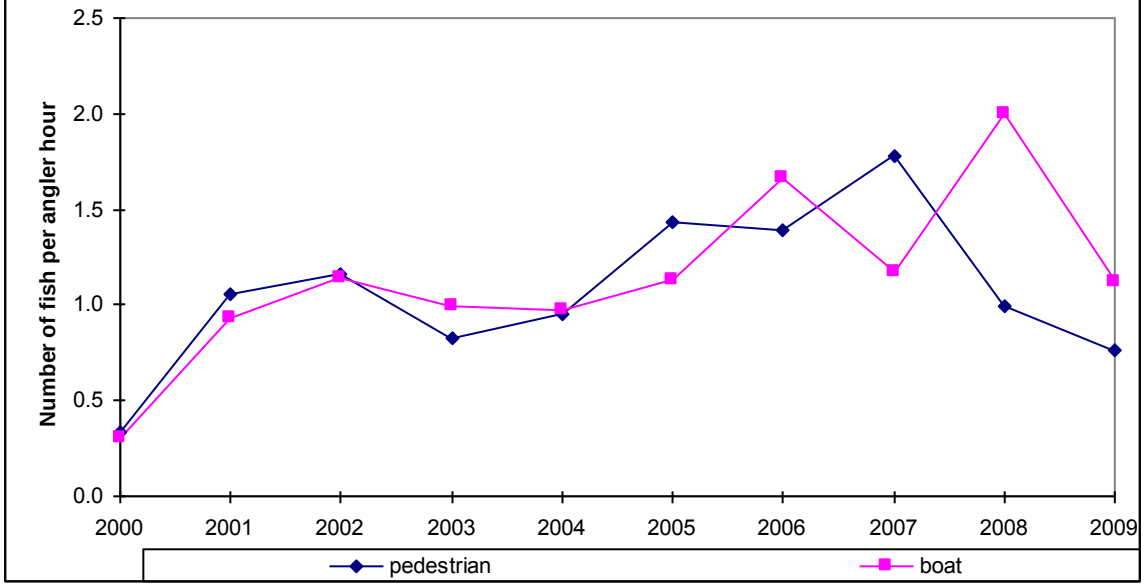


Figure 3 (a). Directed angler effort for salmonids in the Illinois portion of Lake Michigan, 2000-2009

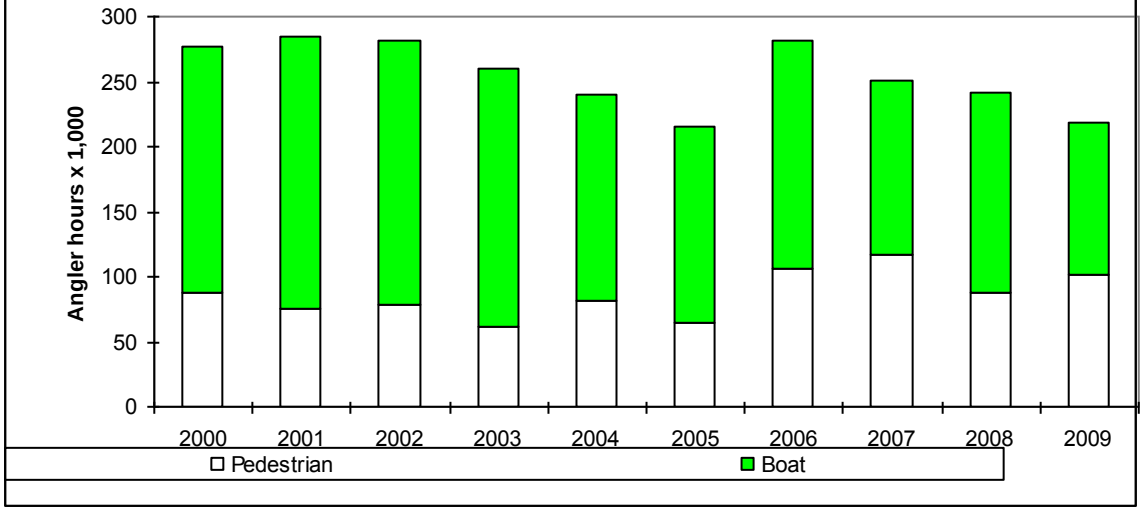


Figure 3 (b). Directed angler effort for yellow perch in the Illinois portion of Lake Michigan, 2000-2009

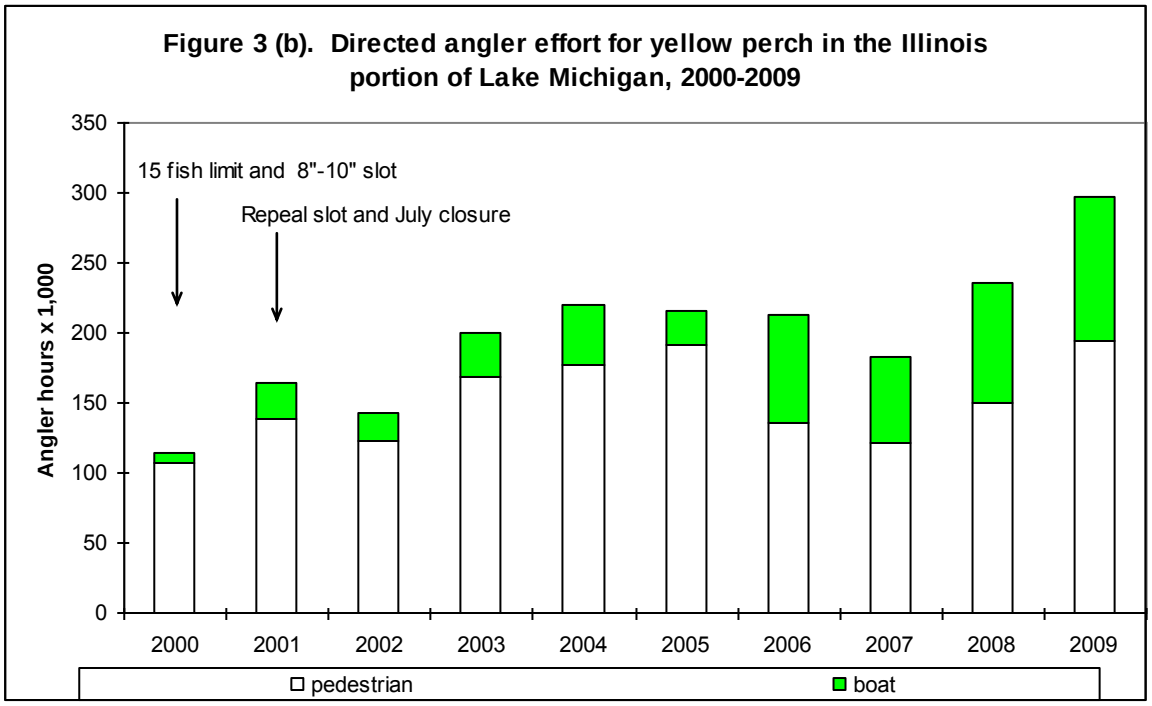


Figure 4. Total yellow perch non-charter sport harvest in the Illinois waters of Lake Michigan, 2000-2009

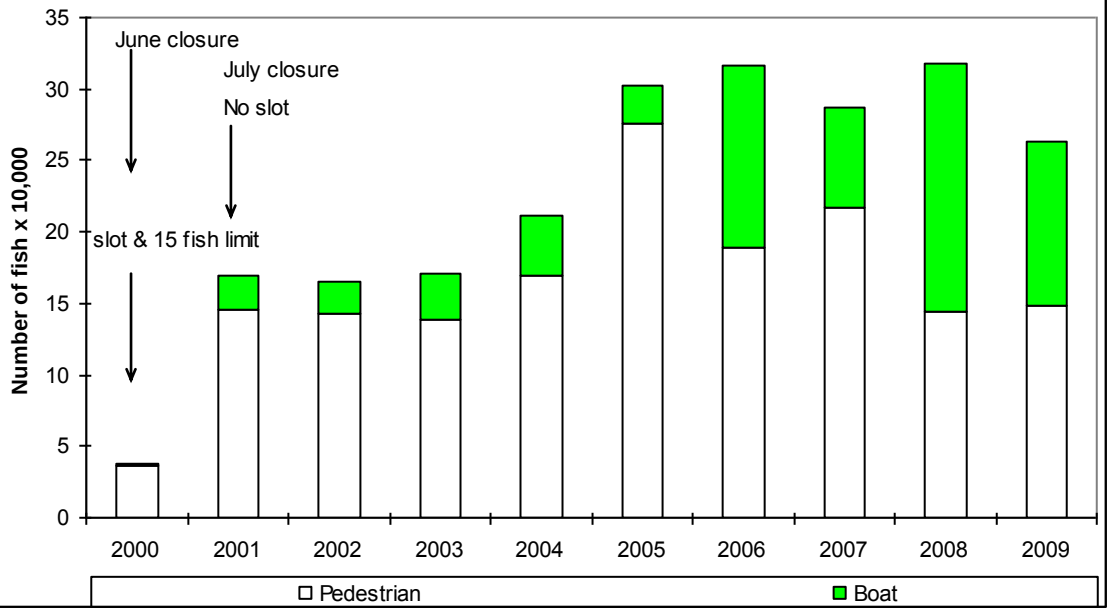


Figure 5. Average lengths of creeled yellow perch from the Illinois waters of Lake Michigan, 1986 - 2009

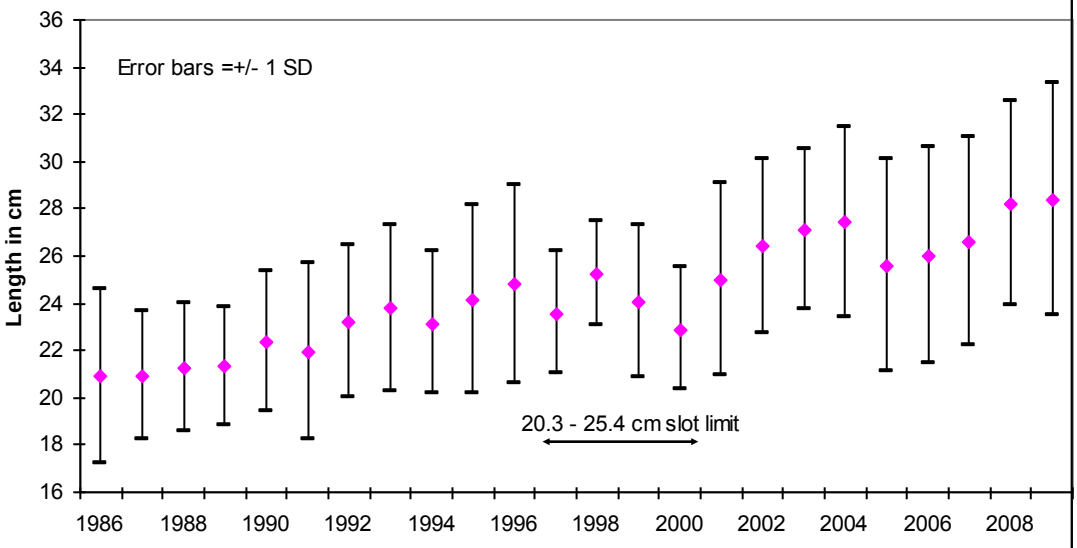


Figure 6. 2009 yellow perch sport harvest from the Illinois waters of Lake Michigan, per month

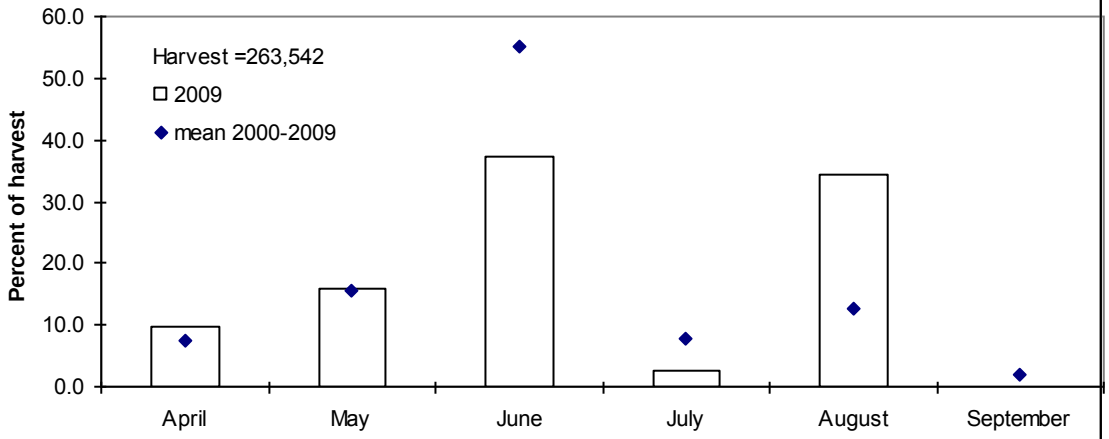


Figure 7. Total non-charter coho salmon sport harvest in the Illinois waters of Lake Michigan, 2000- 2009

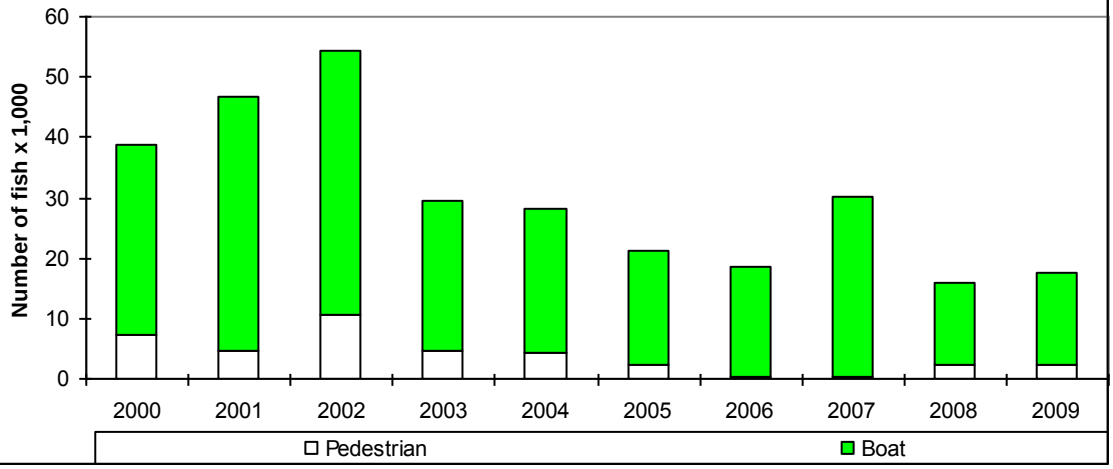


Figure 8. Average lengths of creeled coho salmon from the Illinois waters of Lake Michigan, 1986 - 2009

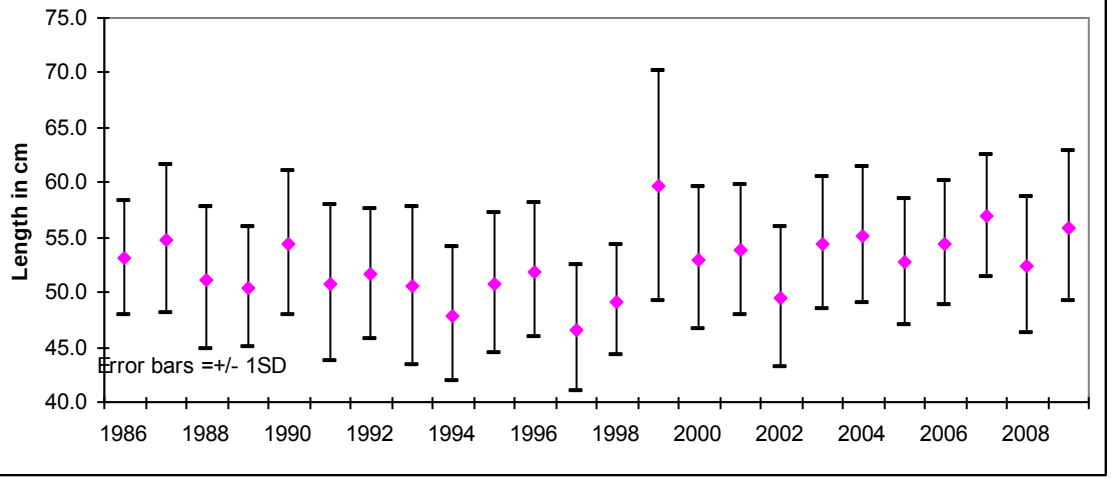


Figure 9. Total non-charter chinook salmon sport harvest in the Illinois waters of Lake Michigan, 2000-2009

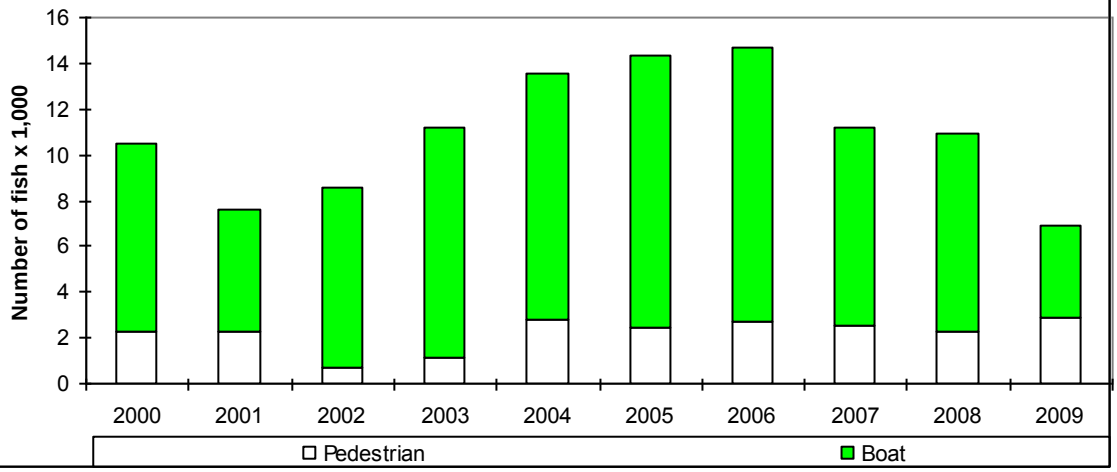
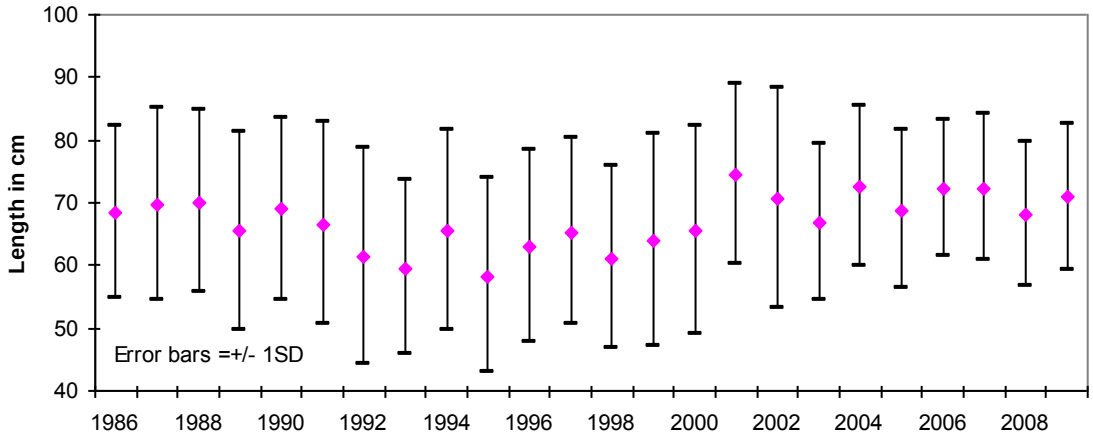


Figure 10. Average lengths of creeled chinook salmon from the Illinois waters of Lake Michigan, 1986 - 2009



APPENDIX A - COMPARISON OF THE CHARTER AND NON - CHARTER SALMONID BOAT FISHERY

A comparison was done to see if the charter and non - charter boat salmonid fisheries were targeting the same species (Tables A1 and A2). In general they have with similar percents of total harvest for both groups. A comparison of harvest per unit effort is also presented (Figure A1). As can be imagined the charter fishery generally out performed the non - charter boat fishery in all years at a factor of 2 or 3 per angler hour. The combined harvest of both charter and non - charter anglers (boats and pedestrians) for 2000 - 2009 is presented (Figure A2). Harvest from early spring surveys are not included in the total.

Table A1. Non-charter boat harvest composition (boats only) April – September 2000 - 2009.

	Effort	Percent of total harvest					
Year	(angler-hours)	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon	Total salmonids
2000	188,887	3.20	4.40	5.30	69.20	17.90	45,719
2001	207,991	1.40	10.30	7.80	71.40	9.10	59,136
2002	201,605	1.40	6.60	5.10	73.70	13.20	59,343
2003	199,369	0.60	7.30	4.90	62.10	25.10	40,006
2004	158,290	1.70	6.10	4.10	60.70	27.40	39,409
2005	151,010	3.00	8.30	3.50	52.50	32.70	36,272
2006	174,621	6.20	7.40	1.90	51.10	33.50	35,787
2007	133,974	1.50	5.10	2.00	70.90	20.50	42,057
2008	153,169	9.10	6.60	5.80	48.30	30.20	28,587
2009	116,514	3.90	5.50	3.10	69.50	18.00	22,095

Table A2. Charter boat harvest composition April – September 2000 - 2009.

	Effort	Percent of total harvest					
Year	(angler-hours)	Brown trout	Rainbow trout	Lake trout	Coho salmon	Chinook salmon	Total salmonids
2000	109,348	2.10	4.40	5.50	79.20	8.70	67,588
2001	109,171	0.90	6.40	8.10	75.00	9.50	63,104
2002	117,381	1.50	3.70	4.40	80.50	9.90	86,635
2003	112,068	1.00	4.20	5.00	69.60	20.30	54,471
2004	110,284	1.70	3.30	4.30	62.30	28.40	51,359
2005	114,599	2.40	8.60	4.00	51.20	33.70	58,473
2006	99,698	1.20	5.50	2.50	54.00	36.70	51,753
2007	87,763	2.90	3.20	2.90	66.50	24.60	50,218
2008	91,756	2.90	5.20	4.60	59.40	28.00	41,499
2009	88,221	2.00	6.70	5.30	59.10	26.90	34,349

Figure A1. Comparsion of charter and non-charter boat salmonid harvest rates for the Illinois portion of Lake Michigan, 2000 - 2009

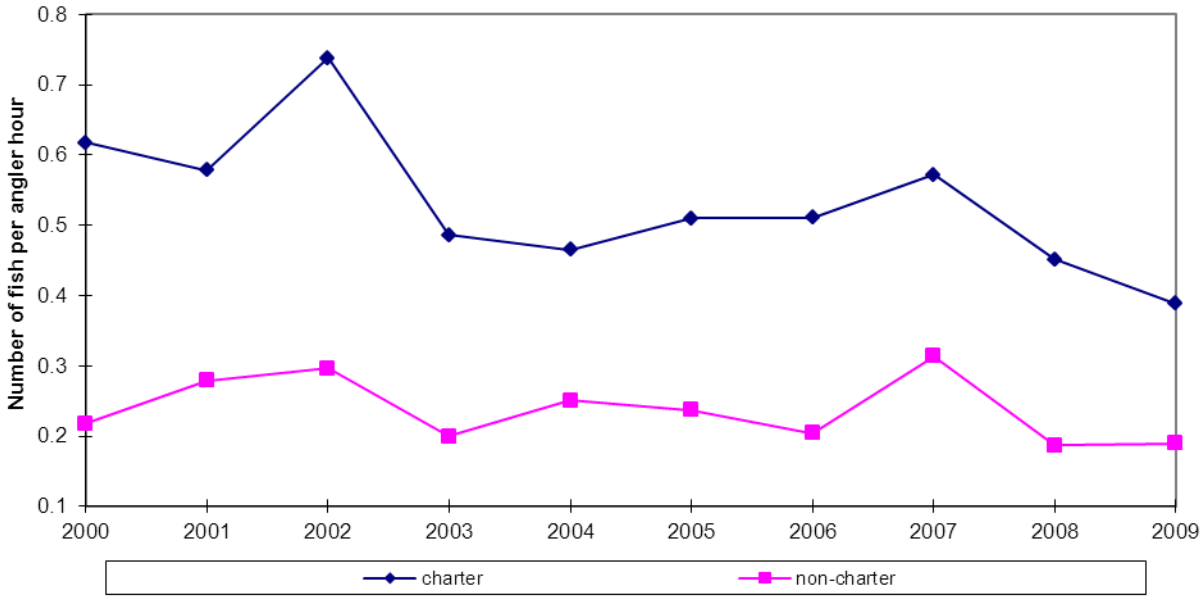


Figure A2. Illinois Lake Michigan sportfishing harvest (charter & regular combined) 2000 - 2009